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ABSTRACT

A modified cloze procedure was used in two studies designed to gain insight into the silent reading process. In the first, involving a small group of third- and fourth-grade children, several stories were prepared based on the assumption that the cloze procedure might be manipulated to reveal a reader's use of semantic, syntactic, and graphophonic cuing systems. As a result of this study, five specific reading/language abilities were identified: finding clues by referring back or ahead into the text, using information already known about the story line or topic ("real world knowledge"), using the cumulative and logical buildup of a story line or topic to make predictions, and using letter clues (replacements controlled by the remaining orthographic clues). A second study was designed around stories that contained deletions made according to the five strategies. The subjects, 39 third-through seventh-grade students, were grouped as "above average," "average," and "below average" readers and administered a cloze procedure task. The results indicated that the above average readers' silent reading behavior was different from that of below average readers. The essential differences centered on focus, the employment of reading strategies, real world knowledge, and the ability to handle graphophonic clues. (FL)

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SOME PSYCHOLINGUISTIC DIMENSIONS OF THE SILENT READING PROCESS - A PILOT STUDY [1]

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By far the most prevalent form of reading behaviour is silent reading. Indeed, unless one is an actor, a news broadcaster or a radio/T.V. commentator, then apart from the odd story read to children at bedtime very few of us indulge in oral reading to the same degree that we read silently. Despite its prevalence as a form of reading behaviour very little is known about how silent reading works, or in some cases why it doesn't work. Because it's an invisible process which takes place "under the skin" of the individual it is not possible by mere observation to determine what strategies the proficient silent reader uses, nor what it is (or isn't) that the not so proficient silent reader is doing as he processes the print before him.

Traditionally silent reading has been researched only indirectly and mainly as a by-product of research into "comprehension", which itself has been researched in a variety of ways; Thorndike the elder for example, researched comprehension by asking the reader to answer a series of questions after the act of silent reading; (Thorndike 1917); Bormuth required his readers to work through a series of sentence completion tasks; (Bormuth 1969,); Yet another approach has been the analysis of a reader's retellings of material which has been read (Kintsch 1976, Fredericksen 1975, Goodman & Burke (1972),while there are some experimental psychologists who make use of laboratory settings and sophisticated tachistoscopic equipment with tightly controlled reaction-time research designs to research the same phenomenon (Kleiman 1975). Despite the wide range of techniques not very much about the ongoing silent reading process has been discovered.

The purpose of this paper is to report the results of a pilot study which attempts to "get at" the silent reading process in a slightly different way, which it will be argued, not only taps more directly into

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[1] Paper presented at New Zealand/Australian Reading Conferences August, 1977, Palmerston North and Melbourne.

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the processes which underly on-going silent reading, but involves behaviour which is more akin to some of the more purposeful, meaning-getting silent reading behaviour that occurs in experimenter free settings.

Rationale of Study

The research to be reported here grew out of (and is an extension of) Goodman's work on the analysis of oral reading miscues (Goodman (1973). The work of Goodman and his colleagues over the past decade has resulted in the development of a model of the reading process which is based on what Goodman calls "psycholinguistic" principles.

According to this model the reader has available to him three major cueing systems which can be used when trying to reconstruct the meanings which an author originally encoded in print. These are -

(a) Graphophonic cues, (i.e. the shapes and sounds of print);
(b) Syntactic cues, (i.e. a reader's "feel" for the way language flows);
(c) Semantic cues, (i.e. a reader's knowledge of the story line or topic being read about and his ability to build up in a cumulative and logical fashion a coherent and meaningful representation of the story as it unfolds).

The process of fluent reading (as the Goodman model describes it) is one in which all three sets of cues are drawn upon the mutually complementary ways, the fluent reader being the one who "gets them all together" (Goodman 1973) in ways that make it possible to get at the meanings intended by the writer. The process (again according to Goodman) involves sufficient visual sampling of salient features of print to set up expectations in the reader's mind. For example the reader's "feel" for the way language "flows along" (i.e. his unconscious knowledge of the syntactic patterns and the probabilities of their occurrence) leads him/her to anticipate (predict, expect) the kinds of syntactic structures which are likely to follow on one another. At the same time his/her understanding of what has a happened previously in the story or topic (s)he's reading about plus his/her real world knowledge [1]

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[1] "Real world knowledge" is defined in more detail further on in the paper. For the moment it will be defined as that mundane, everyday knowledge that we have about how things occur and the relationships between objects and actions. "Real World Knowledge" resembles "scripts" as defined by Nicholson (1977) "piggy bank worlds" as defined by Charniak (1972)

of the story or topic triggers predictions about likely developments in the story or topic. This process continues as (s)he samples another chunk of print which confirms or disconfirms his/her predictions, and so on.

Goodman's model amounts to a detailed description of the oral reading process as it occurs in a relatively natural situation. As such it represents a "blow-by-blow" account of a process which hitherto had been describable in considerably less detail and with considerably more speculation. Goodman's account of the oral reading process leads to certain questions being asked about the silent reading process. Could it (i.e. silent reading) be similarly "opened up" and explained? Is it possible to both explore it and describe it in more detail than is presently possible? Could the covert process which underly silent reading be made more visible by using a paradigm similar in concept to the miscue paradigm used by Goodman? If so, could it be ascertained whether silent reading is essentially similar to oral reading? If the two processes are different how are the differences manifested? Is it possible to develop a silent reading version (and therefore a group administered version) of miscue analysis?

With these questions in mind it was decided to use a modification of Taylor's cloze procedure (Taylor 1953) in order to gain some insights into the silent reading process. In what follows, the rationale for the decision to use cloze will be explicated. Then the results of the pilot study will be described and some tentative conclusions about the silent reading process proposed.

Cloze Procedure as a Window to the Silent Reading Process

Just as Goodman has shown that careful analysis of oral reading miscues can provide a "window" through which to view the oral reading process, the main thrust of what follows will describe how cloze procedure might be used to gain insight into the silent reading process. It should be pointed out that using cloze to make generalizations about silent reading behaviour is not a new idea. Many studies previous to this one have suggested that cloze may be used as a means of tapping silent reading behaviour. As long ago as 1957 Jenkinson conducted a study in which cloze tests were administered to high school students to measure comprehension on three types of literary passages, (Jenkinson 1957).

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Jenkinson selected high and low scorers on these tests for further analysis. These students were given another Cloze test and were asked to verbalize their reasons for the responses which they made. Their reasons and responses were analysed for use of structural clues, semantic clues and approach clues. Jenkinson discovered that the groups differed in their uses of their clues. The high group for example recognised syntactic clues more frequently than the low group and they also exhibited greater verbal flexibility and fluency. It was not the original intention of Jenkinson's work to use cloze as a tool for uncovering the covert processes of silent reading, but she concluded that it had potential as such. More recently a study by Bortnick and Lopardo (1972) made similar suggestions, while Neville and Pugh's studies (1974,1976) also use cloze as a tool for researching silent reading behaviour.

Cloze procedure appears to be an ideal medium for drawing inferences about some of the psycholinguistic parameters of the silent reading process. By carefully controlling and manipulating the kinds of deletion made to a text it is possible to monitor the on-going silent reading process. To complete a text which has various kinds of deletions systematically distributed through it, requires the reader firstly to sample the graphic display and secondly to fill in the gaps by making educated "guesses" (predictions, etc.) about the appropriate word(s) which need(s) to be put back. These educated guesses it seems, are based on a number of psycholinguistic processes, e.g. the reader's feel for the way language flows (i.e. syntactic knowledge) his/her knowledge of the story-line or topic being read about and his/her memory for the way the story/topic has been developing (i.e. semantic knowledge). As Margaret Robertson states "though it is a silent process, the guesses or replacements which the reader makes reveal how much meaning (s)he is getting from the story at any given stage" (Robertson 1977 p. 17).

In other words if one takes a text and deletes words which have a very high syntactic role to play in communicating relationships inherent in the text then one can ascertain from the replacements which a reader makes whether or not (s)he is using the syntactic cues efficiently. Words and constructions which have a high syntactic role in texts are

conjunctions, prepositions, prepositional phrases, inflections which signal tense, degree, number and possession.[1] An ability to replace such word(s) precisely would suggest a firm grasp of the syntactic cueing system. Replacement of syntactically equivalent placeholders (whether synonymous or not) would also reveal a good grasp of the syntactic cueing system in making predictions. Replacements with syntactically inappropriate placeholders or the alteration of the intended syntactic structure may be indicative of an inefficient use of the syntactic cues available.

The efficiency with which the reader is using semantically based cues may be similarly tapped using a controlled cloze technique. If high information bearing content words are systematically deleted (nouns, adjectives, verbs, adverbs) throughout a passage, it is possible to gain insights into how the reader is using his semantic system. This is done by evaluating replacements in terms of their semantic acceptability in much the same way as substitutions are evaluated in the original oral miscue inventory, i.e. is the replacement semantically acceptable ....

- in terms of the whole story?
- in terms of the sentence in which it occurs?
- in terms of a phrase smaller than a sentence?

The efficiency with which the reader samples the graphophonic cues available to him/her can also be revealed by yet another cloze manipulation Imagine a piece of text which reads -

"Because Mary could drive proficiently I loaned her my car."

There are at least three possible types of cloze deletions that could be made with respect to the word "proficiently"

e.g. "Because Mary could drive
- (i) _____
- (ii) p_____tly
- (iii) pr-f-c---tly

I loaned her the car."

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[1] Of course it is not possible to find words which signal only a syntactic relationship and which are totally devoid of semantic overtones. It is possible though to find words or phrases whoses semantic content is low and whose syntactic function is high.

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In the first type (a straight line) there are any number of legitimate replacements that could be made ("well", "efficiently", "slowly") that would not seriously affect the meaning. While such a replacement may reveal a reader's ability to use syntactic and semantic cues, it reveals little about the processes involved in sampling the grapho-phonic cueing system. The second type (p_____tly) could admit either "perfectly" or "proficiently" as a replacement, and again, either would reveal a good sense of syntax and semantics. The third type is, however, different. While the syntax or semantics of the text could admit "perfectly", and while "perfectly" is supported by a cursory visual sampling of beginning and ending letter clues, a more efficient graphophonic sampling will narrow down the possibilities to only one, viz. "proficiently".[1]

Thus, although not originally designed to do so, it appears that cloze procedure might be manipulated to reveal a reader's use of semantic, syntactic and graphophonic cueing systems. Accordingly a number of trial stories were prepared on the basis of this assumption about the cloze procedure. After leaving the first two or three sentences of a story intact, deletions which required an ability to use either of the three postulated cueing systems were spread systematically throughout the story at a rate of between 1 : 5 and 1 : 7. At the same time a taxonomy for assessing the quality of the "NOT-EXACT-REPLACEMENTS" ("N.E.R.s" in abbreviated form) was developed and applied. Table I gives an overview of the taxonomy.

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The first trial involved a small group of grade 3 and grade 4 primary school children who were arbitrarily classified by their teacher as "Above Average" (AA) or "Below Average" (BA) readers.

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[1] Of course in the example cited, the differences between "perfectly" and "proficiently" might be regarded as trivial. I agree. The point is however, that if such carefully controlled cloze deletions were scattered systematically throughout a story, an underdeveloped or inefficient ability to use graphophonic cues might begin to reveal itself.

TAXONOMY OF N.E.R.'s

TABLE 1

	ASPECT OF PSYCHOLINGUISTIC CONCERN	QUESTION ASKED	SUB-CATEGORIES OF ANSWERS TO QUESTIONS
1	GRAMMATICAL FUNCTION	Does the reader's replacement serve the same grammatical function as the intended word(s)?	Y Yes N No P Cannot tell
2	SYNTACTIC ACCEPTABILITY	Does the reader's replacement result in a syntactically acceptable construction?	Y Yes, the complete T-unit is acceptable P Yes, but at Sub T-unit level N No, syntactically unacceptable
3	SEMANTIC ACCEPTABILITY	Does the reader's replacement result in a semantically acceptable construction	Y Yes, at the whole story level. T Yes, but only at T-unit level. P Yes, but only at sub T-unit level with prior portion of the sentence. Yes, but only at sub T-unit level with following portion of the sentence. N No. Totally unacceptable.
4	LOSS OF MEANING	Does the reader's replacement result in a loss of meaning?	N No. There is no loss in meaning at the whole story level. P Change of unimportant detail M Change in major character, incident or sequence. Y Yes. Totally incongruous to the story.
5	PERIPHERAL GRAPHEMIC PROXIMITY	Is there a word in the periphery (two lines before or after) which has a degree of graphemic similarity to the replacement?	Y Yes, a high degree of similarity (2 out of 3 parts identical) P Partially similar (one identical portion) N No similarities.
6	PERIPHERAL PHONEMIC PROXIMITY	Is there a word in the periphery (two lines before or after) which has a degree of phonemic similarity to the replacement?	Y Yes, a high degree of similarity (2 out of 3 parts identical) P One identical portion N No similarities

Results of First Trial

The results obtained from analysing the N.E.R.'s of the small group of readers who participated in the first trial run were as predicted. The AA readers' N.E.R.'s were consistently rated higher than the BA readers' N.E.R.'s on grammatical function, syntactic acceptability, semantic acceptability and maintenance of meaning. The two groups showed about an equal degree of interference from the peripheral lines of print with respect to graphemic and/or phonemic similarities.

However something else of interest came out of this pilot run. In fact it was so interesting that the whole procedure was repeated again, this time with changes to the frequency and nature of the deletions. As well as this, a larger group of children was used. This "something else" which precipitated the whole project being undertaken again is described in the next section.

The Second Pilot Study - Rationale and Ramifications

During the coding of the first pilot study using the taxonomy described in Table 1, it became obvious that some of the AA readers were using strategies which made them appear to be much more efficient readers than other AA readers. It also became apparent that some of the differences were related to identifiable reading/language processes. Although in the first pilot study deletions were made more or less randomly on the basis of whether semantic, syntactic or graphophonic cues were involved, it became obvious that despite this randomness certain of the deletions which resulted necessitated the use of a highly specific type of reading/language process if the intended replacement was to be made. On the other hand quite different processes were used to replace other deletions.

As an example consider the following instance from the first pilot study. The story used in this study was "The Line Down the Middle of the Room" from Goodman and Burke's "Stories for Taping" collection. (Goodman and Burke 1973). The text, as it was given to the children is reproduced below in figure 1.

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THE LINE DOWN THE MIDDLE OF THE ROOM

Victor and Billy were brothers.

"Look what you did! said Victor to Billy one day.

"You broke my plane! "I didn't mean to," Billy said.

Victor picked up his _____ plane. I told _____ not

the exact replacement = "broken"

Figure 1. Sample of Text from one of Tests

The intended replacement for the first deletion is "broken". What kind of reading and/or language process is used to make the intended replacement? In the first place one must obviously use one's feel for the grammar of the language; only an adjective can fit there if the sentence is to retain its Englishness. However, there are literally hundreds of adjectives that could be made to fit without distorting the syntax. What extra knowledge, skill or ability in addition to syntax has to be used if "broken" is to become the choice? Is there some graphophomic cue that will trigger "broken"? Obviously not, as all there is for the eye to pick up is a straight line, thus _____. Does one make a lucky unfounded guess? Perhaps, but the consistency with which some AA readers get the precise word suggests that there's more to it than random lucky guesses. It seems that the fluent reader has some extra skill or ability to bring into play that the not-so-fluent reader doesn't possess. What could it be? Already two sentences prior (s)he's processed "YOU BROKE MY PLANE". Could it be that the fluent reader has in his/her head the concept of a toy plane which was manhandled in such a way as to be "broken"? Could it also be that (s)he also has a well developed sense of a common language process which helps meaning, viz., the ability to refer back to and relate with other words and concepts which have previously occurred, and to use them in ways which maintain intended meaning? In the case of "broken" the reading-language process which enables the replacement to occur might be loosely termed "backwards reference".[1] The reader who replaces "broken" with <u>another</u> adjective (and does so with other deletions similar to "broken") is demonstrating that although (s)he has a good sense of the syntax involved, (s)he is not a powerful a reader as the one who can consistently (and successfully) refer "backwards" into the text to assist in the finding of the exact word. In all five such specific reading/language processes were isolated in the first study, each of them being identified quite fortuitously from

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1 I had originally called this "anaphoric" reference. However, some work by Garrod and Sandford 1977 convinced me that use of the term "anaphoric" (and subsequently "cataphoric") was inappropriate.

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the random deletions made to the text. The full set, with examples of each is set out below.

Specific Reading-Language Abilities Isolated in the Pilot Study

The five abilities that were identified in the study were as follows:

(i) Referring back into the text to find a clue to meaning;
(ii) Referring ahead into the text to find a clue to meaning;
(iii) Real World Knowledge - i.e. the network of meanings and relationships already known about the topic/story being read about;
(iv) Cummulative and logical build-up of story line i.e. monitoring the story/topic line to enable logical prediction;
(v) Use of letter clues; i.e. replacements which are controlled by remaining orthographic clues.

Each will now be described in more detail.

(i) Backwards Reference

For purposes of this study "backwards reference" was regarded as a process which involved the reader in referring back for up to two lines of text [1] in order to gain a clue which would assist him in filling a deletion. The actual deletions which involved backwards reference could take either of three forms, viz.

(a) Exactly the same word:

In a number of instances the deleted word would occur in exactly the same form within the previous two lines. e.g.

"Koalas live almost entirely in _____ (trees)".

Not more than two lines prior to the deletion the sentence -

"Mother koalas spend most of their time sitting in the forks of trees"

had occurred.

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1 Two lines was an arbitrarily chosen number. The only rationale for deciding on two lines was an intuitive belief that going back further than two lines would contribute unnatural reading behaviour.

It is of interest to note that some children replaced "Australia" instead of "trees". While such a replacement is partially semantically acceptable, one of the things that these readers did not do is refer backwards in order to assist in making the precise replacement. If backward reference had occurred then such readers are indicating that they are unable to make full use of such a backward search.

(b) A grammatical variant of the word:

In some instances the deleted word(s) could be found up to two lines of print before the gap, but in another grammatical form. The "broke" - "broken" example previously cited is an example of this.

(c) A different word which in the context of the deletion is synonymous:

In some instances the deleted word was synonymously related to a quite different word which had occurred up to two lines previously, e.g.

"The rain fell heavily. _____(It) made the ground wet". "It", the required replacement, though of different form, refers to rain, and in this context is synonymous with it.

(ii) Forwards Reference

For purposes of this study forwards reference was regarded as a process which involved a reader in referring ahead for up to two lines of text in order to gain a clue which would assist in meaning. "Forwards Reference" clues took exactly the same three forms as "backwards reference" clues, viz; exactly the same word, a grammatical variant of the word or a different but synonymous word.

(iii) Real World Knowledge

For purposes of this study, "Real World Knowledge" was defined

as familiarity with a range of meanings and relationships which were associated with the topic/story being read about. Deletions which tapped this ability were chosen so that nothing in the surface text could offer a clue to the replacement; instead, in order to make the appropriate replacement it was essential for the reader to bring to bear some previously learned and stored knowledge. Consider the following example:

(a) "A burning cigarette was carelessly discarded. The _____ (fire) destroyed many acres of forest". The reader must know from previous experience with the world that cigarettes which are discarded carelessly can smoulder, burst into flames which grow into fires and destroy forests.

(b) "Their small _____ (eyes) are keen and enable them to see in the _____(dark)". Both deletions, to be precisely replaced, tap the reader's knowledge of semantic networks that relate - "eyes", "seeing", "dark", "keen sight" and so on which have been developed through experience with the real world. The concept of "real world knowledge" is similar to Charniak's concept of "piggy bank world" (Charniak, 1972), Nicholsons's "scripts" (Nicholson 1977) and Morris's concept of "scenario" (Morris 1963).

(iv) Cummulative and Logical Build-up of Story/Topic Line

This particular reading-language process refers to the reader's ability to keep monitoring the story line to enable logical prediction of what should be taking place in the story/topic; e.g.

"In the _____(morning) Victor felt _____(cold)".

The story line refers to two brothers who'd been sleeping all night with the window open. The reader who manages to replace the precise words or a semantically appropriate synoym of them needs to have been monitoring the story-line, otherwise many other semantically possible (but contextually inappropriate replacements could be made, e.g. "bed" and "warm".)

(v) Clues Worked out from remaining orthographic clusters

As was previously argued with the "perfectly" "proficiently"

example, some replacements were obviously triggered by certain orthographic clues which were left e.g.

"I j---(just) wanted to see it."

If no letter/letter space clues were available there are other possibilities that could fit in here and still make sense -

"I $\begin{matrix}\text{only}\\\text{merely}\end{matrix}$ wanted to see it".

The good reader, using his/her syntactic and semantic skills and knowledge is aware that "only" or "merely" are possibilities, but the provision of the "j---" acts as a "clincher" to the decision that is ultimately made, and the word that fits the orthographic parameters suggested by the "j" and three letter sized spaces is the one chosen by the good reader.

THE SECOND PILOT STUDY

The identification of these five reading-language processes resulted in the whole study being redesigned around stories which contained deletions based on them. Firstly, stories of appropriate difficulty were selected by the teachers who taught the children. Secondly, deletions which would involve the reader in the use of each of the five reading/language processes were systematically distributed throughout each story, so that after leaving the first sentence or two intact, the deletions occurred at approximatley the rate of 1 : 5. Thus if a 500 word story were used there would be approximately 100 deletions, some of which would necessitate backwards reference, some which would tap forwards reference and so on. Thirdly, a sample of 39 children were selected ranging from Year 3 through Year 7. The 39 children formed 3 sub-groups of 13 Above Average (AA), 13 Average (A), and 13 Below Average (BA) readers. These levels of proficiency were based on teacher judgment. In order to ensure that the readers knew how to go about the task of cloze procedure, a training session was conducted. No time limit was imposed although note was taken of the approximate time each subject took to complete the story. In each instance the reading was done in as natural a classroom situation as possible, i.e. in the children's regular classroom, at their own desks, with their own teachers.

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Recording and Analysing Results

All replacements which deviated from the original text were recorded as "NOT-EXACT-REPLACEMENTS" (N.E.R.'s). These were analysed in two ways. Firstly, each N.E.R. was examined in terms of syntactic, semantic and graphophonic criteria, in much the same way as oral miscues were examined using Goodman's original taxonomy. Secondly, each of the categories of deletion, (i.e. deletions based on backwards reference, forwards reference, etc.) were analysed in terms of semantic acceptability at the whole story level. The aim of the first kind of analysis was to ascertain how readers of different levels of proficiency had handled the silent reading task. The aim of the second analysis was to gain some insights into how readers of different levels of proficiency used each of the five reading/language processes which the author was attempting to tap. Both analyses were aimed at discovering patterns of replacement which would give insights into the processing strategies employed by readers of different levels of proficiency. Ultimately it was hoped that some insights into the silent reading process might be revealed through these emerging patterns. The results of both analyses are presented below.

FIRST ANALYSIS: A COMPARISON OF N.E.R.'s of READERS OF DIFFERENT LEVELS OF PROFICIENCY

Figure 2 is an example of how this analysis was carried out. It shows a segment of text with the N.E.R.'s circled and the judgments made by the coder.

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Results of First Analysis

The results of the 39 children who took part in the pilot study are presented in the tables which are discussed in specific detail below. The results of applying the taxonomy of N.E.R.'s to the three groups of readers are generally as the Goodman model would predict. The AA readers' performances were higher on categories 1-4 of the taxonomy than the A readers, who in turn performed higher than those readers judged to be BA. This can be interpreted as an indication that those readers judged to be above average by their teachers are more proficient readers because

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Then it was w-nt-r and the sun stayed behind the clouds more often. Rain fell from the clouds and Stevie made a big snowman. Soon summer came around again. Stevie started to plant a garden. Then came the day that Stevie liked best of all. His birthday! A whole year had gone by. Many things had changed. Stevie's puppy was a big puppy now. His kitten was a grown-up cat with babies of her own. The baby chickens were fat, brown things laying eggs every day.

SECTION 1

CLUE	INTENDED WORD	REPLACEMENT	1 GRAMMATIC FUNCTION	2 SYNTAX ACCEPT.	3 SEMANTICS ACCEPT	4 MEANING LOSS	5 PER.GRAPH PROXIMITY	6 PER.PHON PROXIMITY
___	Snow	Rain	Y	Y	N	Y	Y	Y
___	Sky	Clouds	Y	Y	Y	N	Y	Y
S-----	Spring	Summer	Y	Y	P	P	N	N
___	dog	puppy	Y	Y	Y	N	Y	Y
___	kittens	babies	Y	Y	Y	N	N	Y
___	hens	things	Y	Y	Y	N	Y	Y

they have more control over the semantic and syntactic aspects of the silent reading process. Some interesting trends are noticeable in the results of each category of the taxonomy.

Category 1 - Grammatical Function

Table 2 shows the results of the ability to maintain grammatical function.

PROFICIENCY LEVEL	SAME GRAMMATICAL FUNCTION	DIFFERENT GRAMMATICAL FUNCTION
BELOW AVERAGE	41.4%	58.6%
AVERAGE	66.2%	33.8%
ABOVE AVERAGE	77.8%	22.2%

Table 2. N.E.R.'s and Grammatical Function

The results shown in Table 2 indicate that the AA readers who participated in this pilot study could maintain grammatical function at about twice the rate as BA readers, i.e. 41.4% vs. 77.8%. While the difference between AA and BA readers is dramatic, that between A and AA is not nearly as great.

Category 2 - Syntactic Appropriateness

Table 3 summarises the judgements which were made by the coders about the syntactic appropriateness of each N.E.R.

PROFICIENCY LEVEL	SYNTACTICALLY APPROPRIATE AT SENTENCE LEVEL	LESS THAN SENTENCE LEVEL	NOT SYNTACTICALLY APPROPRIATE
BELOW AVERAGE	31.6%	14.2%	53.4%
AVERAGE	67.6%	13.2%	19.2%
ABOVE AVERAGE	89.0%	0.8%	10.2%

Table 3. N.E.R.'s and Syntactic Appropriateness

Table 3 suggests the following inferences:

(i) B.A. readers fail more times than they succeed in maintaining syntactic appropriateness at the sentence level. On the other hand AA readers can maintain the syntactic integrity of whole sentences almost 90% of the time (i.e. 89.0%).

(ii) A. and B.A. readers produce approximately the same number of partially syntactic chunks of language - i.e. phrases which are less than complete sentences. A.A. readers rarely produce "partials". Their replacements (i.e. AA readers') are either fully syntactically appropriate or totally inappropriate - there are few shades of grey.

Although not shown in the tables the "partials" referred to in (ii) above were re-examined. This re-examination produced an interesting observation, viz; In the overwhelming majority of cases these "partials" were appropriate only with the first portion of the sentence and very rarely with the latter half. This suggests that context, especially that which came after the deletion, was not used very efficiently. It also suggests that replacements were made as soon as blanks were encountered. The fact that AA readers had a very low rate of "partials" in the syntactic appropriateness category suggests that they used quite different reading strategies to the less able readers when they encountered a blank. Their very low rate of partials strongly suggests a highly developed ability to process sentence sized chunks. It also suggests a strategy of going past blanks prior to making a judgment about the syntactic appropriateness of the replacement that is eventually made, something which the A and BA readers are not able to do with the same degree of consistency.

Category 3 - Semantic Appropriateness

Table 4 shows the coding judgments which were made with respect to the semantic appropriateness of each N.E.R.

PROFICIENCY LEVEL	SEMANTICALLY APPROP. AT WHOLE STORY	SEMANTICALLY APPROP. AT SENTENCE LEVEL	LESS THAN SENTENCE LEVEL	NOT APPROP.
BELOW AV.	19.0%	8.2%	12.4%	60.4%
AVERAGE	42.2%	16.8%	20.0%	21.0%
ABOVE AV.	67.6%	14.6%	14.2%	3.6%

Table 4. N.E.R's and Semantic Appropriateness

The percentages shown in Table 4 strongly suggests that AA readers are better able to maintain the story line than the other two groups. This is indicated by the high percentage of replacements which were semantically appropriate at the whole story level.

Category 4 - Maintenance of Meaning

Table 5 contains the judgments made about the degree to which each N.E.R. altered the author's intended meaning.

PROFICIENCY LLEVEL	NO LOSS OF MEANING	CHANGE OF MINOR DETAIL	CHANGE OF MAJOR DETAIL	TOTAL LOSS OF MEANING
BELOW AVERAGE	12.2%	16.0%	5.4%	65.8%
AVERAGE	34.4%	28.6%	12.4%	23.5%
ABOVE AVERAGE	46.8%	37.2%	9.4%	6.4%

Table 5. N.E.R.'s and Maintenance of Meaning

The trends noticed in the Category 3 results are confirmed and reinforced by the above table. Because the distinctions between the "No Loss of Meaning" category and the "Change of Minor Detail" category are minimal, it is feasible to collapse these two categories into one and sum the percentages in each. The resulting percentages should reveal something about the degree to which the different groups are actually comprehending the on-going story line. When this is done it can be seen that while

the AA readers generally maintain (and therefore comprehend) about 84% of the story line, A readers can manage only a 53.0% comprehending score, while the BA readers on-going comprehending drops to 28.2%.

Categories 5 and 6 - Peripheral Graphemic/Phonemic Similarity

The degree to which a similar looking ("graphemic") or similar sounding ("phonemic") word in the surrounding lines of print may[1] have triggered the readers' responses is shown in Tables 6 and 7 below.

PROFICIENCY LEVEL	SIMILARITY	NO SIMILARITY
BELOW AVERAGE	20.0%	80.0%
AVERAGE	35.8%	64.2%
ABOVE AVERAGE	18.4%	81.6%

Table 6. N.E.R.'s and Peripheral Graphemic Similarity

BELOW AVERAGE	20.0%	80.0%
AVERAGE	35.8%	64.2%
ABOVE AVERAGE	18.4%	81.6%

Table 7. N.E.R.'s and Peripheral Phonemic Similarity

In order to discern trends more clearly the "Y" and "P" categories are collapsed into a single "similarity" category. The differences between the three proficiency levels is not as dramatic as for the other 3 groups.

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1 "May" is emphasised here because there is no way of ascertaining whether similar looking or sounding words in the periphery actually did trigger the child's response. It could be that there is a certain probability that similar words will occur anyway.

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From a quantitative point of view at least it seems that all three groups were influenced to about the same degree by the phonemic and/or graphemic elements in the periphery. However a closer analysis reveals that the AA readers replacements were also more consistently appropriate in terms of syntax a and semantics. This suggests that the graphophonic similarities noted between the words in the immediate periphery and the AA readers' replacements are, in the main, fortuitous, their replacements being caused more by a focus on meanong than by a belated attempt at matching some nearby graphophonic pattern. On the other hand the BA readers' lack of semantic and syntactic appropriateness suggests that their focus was not on meaning, but rather on the visual display, and because they'd lost control of the story line, they were reduced to looking for some kind of graphophonic match to fill the gap. In some respects the trends revealed in Table 7 8 suggests some explanations which might account for the demonstrated superiority of AA readers when engaged in silent reading.

Insert Table 8 Here

Firstly the backwards and forwards reference results show that AA readers when confronted with a piece of text which contains difficulties for them (such as unknown graphic shapes or unusual syntactic structures), are more likely to work out the precise word intended than are less proficient readers. In those instances where they don't manage the exact word they manage a replacement which is consistently judged to be semantically appropriate at the whole story level. One inference which can be drawn from these results is that AA readers can (and do) use consistently the strategy of reading back or forward into the text in an effort to get at the meaning of the text, whereas the not so proficient readers don't.

The co-occurrence of these two characteristics (reading ahead and back, and maintenance of a high degree of meaning) suggest a possible cause-effect relationship. There is however no clear indication of the direction of the relationship. Do AA readers maintain a high degree of meaning because they have developed the characteristic strategy of reading forward and going back into the text to assist them, or do they read back and forward because

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The Second Analysis: an examination of the replacements to deletions based on the five reading/language processes:

The results of the second analysis are presented in the following set of table.

	PROFICIENCY LEVEL	% EXACT REPLACEMENTS	% N.E.R.s SEMANTICALLY APPROPRIATE AT WHOLE STORY LEVEL
BACKWARDS REFERENCE	B.A.	38.0%	26.5%
	A.	67%	50%
	A.A.	79%	87.0%
FORWARDS REFERENCE	B.A.	39.0%	22.5%
	A.	68.5%	40.75%
	A.A.	85.0%	81.5%
REAL WORLD KNOWLEDGE	B.A.	35.5%	31.0%
	A.	47.5%	52.3%
	A.A.	74.0%	83.8%
CUMULATIVE AND LOGICAL BUILD UP	B.A.	27.3%	28.8%
	A.	49.8%	50.8%
	A.A.	74.3%	70.8%
ORTHOGRAPHIC CLUES	B.A.	52.3%	38.3%
	A.	67.8%	52.8%
	A.A.	68.5	69.3

Table 8. Exact Replacements and Semantically Appropriate N.E.R.'s for each Reading/Language skill

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they have a need to maintain and control meaning? Whatever the direction of the relationship it appears to be one important characteristic of efficient silent reading.

By contrast, the not-so-proficient readers results (with respect to backward and forwards reference) suggest a quite different pattern of behaviour. Either they don't have the meta-linguistic knowledge that proficient readers have (i.e. reading should make sense at the whole story level) or if they do, they don't know how to go about achieving such sense (i.e. they can't or won't initiate the forward and backward searching behaviour which is conducive to meaning getting).

The "real-world knowledge" of the second analysis, (Table 7) reveals a similar trend with respect to different proficiency levels. The fact that AA readers seem to be able to make more use of what was judged to be "real-world knowledge" than did either A or BA readers, merely reflects one of the basic tenets of a psycholinguistic account of the reading process - i.e. that one of the bases for prediction, in the reading process is the reader's knowledge of the story and/or topic being read about (i.e. the "piggy-bank world" of Charniak 1972).

These trends in fact, confirm the generally held principle that, as a group, AA readers not only know how to initiate backward and forward searching behaviours, but that they can bring to bear a much wider range of accumulated meanings and experiences. Perhaps if BA readers were "taught" the same backward and forward searching strategies, their reading problems would still not be completely solved until their bank of real-world knowledge was similarly expanded.

With respect to those deletions which allegedly necessitated the readers cumulatively building up and logically developing a story-line, (Table 7), the trends are similar and the inferences almost identical - i.e., better readers maintain and monitor the story more efficiently than not-so proficient readers, but whether this is the cause or result of more efficient reading behaviour, is not clear.

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The differences between the three groups on those deletions which can be worked out on the bases of remaining letter clues is not so dramatic, (Table 7), although it suggests that BA readers are not as efficient at doing it as the other two groups. This category of deletion however, is not a "clean" one in that it is contaminated by semantic and syntactic knowledge as well. What it does suggest is that whatever it is that distinguishes proficient from poor readers has less to do with differences of ability in the grapho-phonic domain than differences in other areas of the reading process.

SUMMARY OF RESULTS

Though limited by the small sample size and the "fuzziness" of the boundaries between some of the categories and sub-categories of the taxonomy, the results of this pilot study, while not specifically answering all the questions, at least supply tentative answers to some which motivated it. Of course one has to assume that the silent reading task which the readers were asked to perform in this study is similar to the kind of purposeful silent reading that is done when one attempts to get meaning from text which is unmutilated. If this assumption is not granted then this whole pilot study becomes one of mere "puzzle-solving", which is remote from the reading task. If, however, the validity of the assumption is granted then several conclusions of interest can be drawn; viz:

1. AA readers' silent reading behaviour appears to be quite different from BA readers' silent reading behaviour.

2. The essential differences appear to centre around,

   (a) <u>The focus of the different groups</u>:

   Proficient readers appear to be able to control meaning at macro - or "whole story" level, whereas the BA readers seem to restrict their focus to a much smaller unit of meaning, as if there were no threads running through the story.

   (b) <u>The reading strategies employed</u>:

   AA readers seem to be able to go back or forward

into the story when searching for clues to meaning much more effectively and readily than BA readers. Whether their behaviour is the cause or result of 2 (a) above is not immediately obvious.

(c) Real-World Knowledge:

AA readers appear to have a wider background semantic knowledge to bring to bear to the silent reading tasks that they were asked to do in this study.

(d) Ability to handle graphophonic clues:

AA readers were able to use any graphophonic clues which were left, more efficiently than BA readers. However these differences were not as dramatic as some others. It is reasonable to assert that of all of the possible causes of different reading ability between high and low proficiency readers, knowledge and skill in the graphophonic domain, does not play the most important role.

3. The pilot study is encouraging in terms of the development of a silent reading version of the Reading Miscue Inventory (Goodman & Burke 1972). Although there is no way of systematically assessing the correcting behaviour which silent readers may engage in, it is feasible that a paper and pencil group version of the R.M.I. could be constructed which would reveal some of the strengths and weaknesses that individual readers may have in silent reading.

FUTURE DIRECTIONS

There are a number of problems which need to be solved if the techniques piloted in this study are to be developed to the stage where they could be considered as providing windows through which the silent reading process can be viewed. These are:

(i) The coding rules for allocating N.E.R.s to the categories of the Taxonomy need to be delineated with more specificity. This is essential for a high degree of coder reliability to be developed. At the present time

no coefficients of reliability have been attempted.

(ii) The rules and methods for deciding deletion categories need to be a lot "cleaner".

(iii) More deletion types need to be experimented with, just in case some reading language processes other than those delineated in this study are involved in silent reading.

(iv) A means of getting at "correcting behaviour" needs to be explored. Perhaps a sample of child readers who are also "loud thinkers" needs to be isolated and given the silent reading tests to work with. If they are truly "loud thinkers" and their verbalised thoughts can be captured on tape as they work through a text with controlled deletions systematically scattered throughout it, some insights into correcting behaviour might be found.

(v) The problems of matching material to be clozed with a reader's independent level of reading, (i.e. a silent reading corollary of Marie Clay's error rate) needs to be worked out. Otherwise there is no way of telling whether the patterns of N.E.R.s which emerge are typical of the readers or are a function of being asked to perform a reading task which is beyond him/her. For the present pilot study, those readers who suddenly become incapable of filling deletions with any kind of word (meaningful or nonsensical) were regarded as having lost all control of the reading-for-meaning-process, and they were given an easier story with which to work.

CONCLUDING REMARKS

In spite of obvious problems which are yet to be solved, there seems to be some potential in the approach described in the study. Firstly, it does have promise for researching some of the psycholinguistic parameters of the silent reading process in much the same way as

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Goodman researched oral reading. Secondly, it does provide a technique for producing a pencil and paper, group administered, silent reading version of the R.M.I. If it were possible to refine the technique and the taxonomy to such a degree that it is a reliable and valid technique for diagnoses, then the savings in administration time (group v. individual) would make it worthwhile. Not only this, but it would provide the basis for a diagnostic instrument based on psycholinguistic principles. It is a sad fact that the only diagnostic instruments of a group nature which are available in the reading area for Australian teachers at least, are those which are based on a sub-skills approach to reading. All that concerns me is the possible name that such an instrument might be given. One of my less reverent and respectful students (who, incidentally, was instrumental in collecting and analysing the pilot study data) labelled it the "Cambourne Reading Assessment Procedure". Put the first letters of that label together and you'll understand my apprehension. Hopefully, the results of this pilot study suggests that its potential belies the possible label.

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